



C.U.SHAH UNIVERSITY – Wadhwan City

FACULTY OF: -Technology and Engineering (Diploma Engineering)

DEPARTMENT OF: - Civil Engineering

SEMESTER: - VI **CODE:** -2TE06BGS1

NAME –Building Services

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme								
		Th	Tu	Pr	Total		Theory				Practical (Marks)				Total
							Sessional Exam		University Exam		Internal		University		
							Marks	Hours	Marks	Hours	Pr	TW	Pr	Tw	
2TE06BGS1	Building Services	04	02	00	06	05	30	1.5	70	03	---	20	30	--	150

Objectives: At the end of this course students will be able to

- Know various types of building services required
- Plan and design the various building services like water supply, Building drainage, rain water harvesting etc.
- Know various types of tools and accessories required to design plumbing and sanitary services
- Know various installation services like fire fighting extinguisher, elevators and maintenance of building environment by designed ventilation
- Know necessity of eco friendly services

Pre-requisite: Building services like water supply, sanitary services, rain water harvesting, elevators and fire protection systems form an essential part of every residential and commercial building. No building can be put into effective use without these services. Also now days the eco friendly design of these systems are on demand. It is necessary for the students to understand the basic principles of building services.

Course Outlines:-

Sr. No.	Course Contents	Teaching Hours
1	Introduction: 1.1 Comfort standards and Types of various installation services,	03
2	Water Supply & Distribution: 2.1 Plumbing engineering – Principles of plumbing, General properties of water, Per capita supply, Service connections from municipal main, Storage of water (underground & overhead), water meter (Sizes and its fixing). 2.2 Hydraulics of Plumbing - Loss of heads in pipes & fittings (Major and Minor Losses) and its effects, flow formulae, Causes and prevention of air lock & cavitations. 2.3 Plumbing of high rise buildings – Types of various water supply systems (down take pressure reducer valve system, multiple storage system, break pressure tanks, hydro pneumatic systems), Pumping system.	16
3	Sanitary Services: 3.1 Sanitary appurtenances - Classification of fixtures (ablution fixtures and Soil fixtures), bathroom accessories & fittings. 3.2 Building Drainage- General principles governing building drainage, Nature of drainage	10

	phenomenon, Various plumbing systems (one pipe, two pipe, single stack single stack partially ventilated and hybrid), design and capacity of pipes (primary & secondary braches), Anti siphon & vent piping installation of pipes,	
4	Rain water harvesting system: 4.1Introduction, Collection of runoff, pipe system, design consideration, Road surface runoff (open drain and closed drain), Disposal of rain water (surface and under ground rain harvesting)	07
5	Elevators: 5.1Construction aspects of Lift, types of lifts, essential features of a Lift (machine room equipment, lift well, lift pit, lift landing door, lift car), Electrical requirements, preventive maintenance & legal formalities of elevators.	08
6	Fire Fighting Installations: 6.1Requirement and storage of water 6.2Systems of fire fighting – External (pillar and flush hydrants), Internal (residential and industrial), training to personnel for service & maintenance and safety measures. 6.3Maharashtra fire Prevention and Life Safety Measures Act, 2006	07
7	Building Environment: 7.1Necessity of HVAC, comfort standers, System of ventilation (natural and artificial ventilation), lighting, noise (recommendations to minimize noise) & acoustics, Introduction to eco friendly building services and concept of Green building.	07

Sr. List of Exercises

No.

1. Study of types of pipes used for plumbing and sanitary services, pipe fittings, valves and tools required for fittings
2. Study of types of pipes used for plumbing and sanitary services, pipe fittings, various traps used for sanitary fixtures and tools required for fittings
3. Study of existing scheme involving all types of services with sketches.
4. Design of water supply, sanitation & storm water system for G+1 storey building with sketch.
5. 5-Assignments based on the syllabus.

Term Work Students should submit journal of above exercises.

Learning outcomes: It understand of Building services like water supply, sanitary services, rain water harvesting, elevators and fire protection systems form an essential part of every residential and commercial building.

Text books:

1. Plumbing Engineering (Theory, design & practice) by S.M. Patil, Publisher Seema publications, Mumbai 2nd Edition 2007
2. Building Services by S.M. Patil, Publisher Seema publications, Mumbai 1st revised edition 2008

Reference Books:

1. Plumbing Design and practice by S. Deolalikar, Publisher Tata McGraw. Hill publishing company, 1st edition 2008
2. Design & Practical Handbook on Plumbing by C. R Mohan, Standard Publishers Distributors, New Delhi, 1st edition , 2009
3. A to Z of practical building construction & its management by Sandeep Mantri, Publisher Mantri Institute of Development & Research, 9th edition, 2009-10